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## COULD CALIFORNIA BECOME A ZERO-EXTINCTION STATE?

California plant lovers are finding—and nurturing—species once presumed to be extinct in the wild.

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The scientists didn't blindfold me or stuff me in the trunk of their car, but they did make me swear a sacred vow that I would never reveal the precise location of their treasured, secluded, exceedingly rare shrub. So I can't tell you where or how to find the plant, but I can say that it lives on the wild western edge of this continent. I can say that it overlooks the Pacific Ocean and clings to existence on a lonesome plot in San Francisco's Presidio park. I can say that it may be the luckiest damn thing on Earth, having survived a series of freakishly close shaves with extinction. In fact, the Franciscan manzanita, with its pink blooms and sweet berries, was once considered extinct in the wild. But then, one day, it wasn't.

On the cool afternoon I went to visit this manzanita, smoke from searing fires in Sonoma and Napa in the north choked the air and gave the city an eerie golden glow. Lew Stringer, a rakish auburn-bearded ecologist who works on staff at the Presidio, was my guide. We were accompanied by Diony Gamoso, a biological science technician, and Dan Gluesenkamp, the executive director of the California Native Plant Society.

This exuberant gang of public servants and plant lovers climbed out of the car and descended into a thick hedge of native ceanothus, winding past coastal oaks and dry winter grass until we arrived at the secret destination. The manzanita stood solitary on an arid hillside, its squat body soaking up the partial sunshine.

"It looks good!" Stringer said, after listing off the various potential maladies—drought, rodents, disease—that threaten it still. He was relieved, as were Gamoso and Gluesenkamp. Together, they are the three people largely responsible for keeping the manzanita alive as a wild species. They like to know that Francie, as they call the plant, is safe and sound. Francie, after all, is a figurehead of sorts.

In May of 2016, Gluesenkamp and the California Native Plant Society, or CNPS, announced an unusual new project that seeks to reverse floral extinction in this abundantly biodiverse state. It's not the sort of de-extinction that normally grabs headlines—the group isn't using tissue samples and modern technology to resurrect critters that vanished centuries ago. Rather, CNPS believes that the 22 California plant species that are currently presumed extinct in the wild may simply be very rare and difficult to locate. They may merely be lost.

CNPS wants to find them. To that end, it has compiled a detailed list of the species currently considered extinct in California, with information about their last known whereabouts. It has started training its sprawling network of volunteers to take trips into overlooked corners of the state to search for these species. And it has already had success. Indeed, the Franciscan manzanita is a fascinating emblem—a poster child—of this effort. Though it was saved from annihilation before CNPS's initiative officially kicked off, the shrub is a particularly prominent example of the organization's zeal for rediscovering what is gone. It foreshadows de-extinction stories still to come.

In 1985, the biologist Michael Soule wrote that conservation biology is often a "crisis discipline," one concerned with rapidly responding to the loss of habitat and stopping the eradication of species. It is a discipline in protest against the destructive tendencies of modern civilization. It catalogues catastrophe, and so it can often seem grim.

But it has produced plenty of hopeful tales too—and the long track record of de-extinction is one of them. In fact, the rediscovery of lost species, though little discussed, occurs regularly. As the biologist John Zablocki and his colleagues wrote in a 2016 article in the journal *Conservation Biology*, conservationists have had consistent success scouring the globe for animals and plants that were once thought lost for eternity. Scientists have documented at least 351 species rediscoveries between 1889 and 2011, or about three per year, according to the paper.

Dan Gluesenkamp of CNPS, a lanky man with wispy brown hair and a gleeful passion for all things plants, contributed to that tally.

One day in 2009, Gluesenkamp was guiding his car across the Golden Gate Bridge, returning to San Francisco from a conference in northern Sonoma County. When he crossed into the city, he came upon an enormous road reconstruction project. Crews of laborers with heavy machinery were tearing up the trees and shrubbery, preparing to refurbish the complicated maze of concrete that converges at the northern tip of the San Francisco peninsula. By chance, Gluesenkamp looked out the window and saw in the highway median a single shrub surviving amid the chaos of construction. A veteran roadside botanizer, he thought he recognized the plant, but he didn't know why. He wanted to stop his car and scope it out, but there was nowhere to pull over.

Gluesenkamp returned to the site later in the week, and strained to see the plant, but as his car whizzed by he still wasn't sure how to identify it. So he made a third pass, this time sticking his head out the window, hoping it might offer a better glimpse.

"I tried to take a photo and look at it and it was just this blur. Total abstract art," Gluesenkamp says. "And so I phoned Lew [Stringer] and got his answering machine."

He left a message describing what he saw, and when he called back a few moments later, Stringer picked up excitedly. *We're going. We're packed up. We got it*, he told Gluesenkamp.

Stringer and a colleague left their office in the Presidio, sped to the site, and ran across several lanes of oncoming traffic to reach the highway median. They studied the mysterious plant. They were shocked. They were thrilled. Sitting before them was a sprawling shrub that they'd later identify as Franciscan manzanita, a species not seen in the wild since the mid-20th century. The last sighting of a wild Franciscan manzanita had occurred in post-war San Francisco, when a famous female California botanist named Lester Rowntree snuck into a city graveyard slated for demolition, rescued at least one manzanita specimen from certain destruction, and deposited it at a botanical garden for safe keeping. Francie, though, had lived in the middle of a busy highway, in the city's iconic northern entrance, all along. And by sheer luck, the road construction crew had not yet torn it out and turned it into wood chips.

"It was—" Stringer said, and paused. "It was really shocking."

Over the course of the next year, Stringer and his team came up with a plan to save the plant. They scouted a suitable new home in the Presidio that provided the habitat it needed to survive. They found government funding to pay for its relocation. (Indeed, the funding caused a fleeting political firestorm when conservative media found out about the project and politicians like Ted Cruz denounced it as wasteful government spending.) And finally, after hiring a forestry contractor to do the work, the team encased the manzanita in a metal cage and, on a rainy day amid driving winds, they surgically removed it from the ground and moved the shrub to its new residence.

The plant suffered for the first few years after relocation. Its root system receded due to lack of water. It experienced a die-off of sorts. "There was concern it might die altogether," Stringer says. "We just didn't know." But with the help of an irrigation system, Francie made it through. Now scientists are trying to make it thrive. Early in the year, they began the process of breeding clones of the specimen with the descendants of the Franciscan manzanitas that still live in a botanical garden in the Berkeley hills.

"To actually de-extinct the species we are going to need them to breed and propagate on their own, through natural processes," Stringer says. "So that is what the goal is."

As the Franciscan manzanita continues its fragile journey on Earth, Gluesenkamp and CNPS have turned their attention to the other California plants presumed extinct in the wild. Since the launch of the group's de-extinction project, it has had at least one major potential success. Last year, a staffer named David Magney traveled to Los Angeles County and, after two days rambling through the brush in a busy suburban park in the floodplain of the San Gabriel River, he found in a dry pond a low wetland plant that he believed to be Parish's gooseberry. The Parish's gooseberry is on the list of species presumed extinct in the wild in California. It has not been seen in its natural habitat since 1980. Magney was thrilled at his discovery, though his excitement has tempered: He's still trying to confirm that the plant was, in fact, the Parish's gooseberry. "I am Swedish. We don't express our emotions much," he says of the sighting. "but inside I was jumping up and down."

Gluesenkamp is confident that there are more de-extinctions still to come. As we huddle around Francie, admiring its waxy leaves, its wild fortune, and its bizarre life history, he explains that the long-lived plant likely germinated in the 1930s, when construction crews were building the bridge. It has been around for nearly a century, and no one knew it was there for most of that time. A flowering bush this big, this beautiful, survived unnoticed for decades, he says, and that fact has hopeful implications for other extinct plants in California.

"So here is the story of California flora," says Gluesenkamp, with an infectious enthusiasm that makes plants seem like the most important thing on the planet. "For a lot of reasons we have this insanely huge flora. [California] is one of the 34 global biodiversity hotspots." He holds his hands about eight inches apart. He says that, if you counted all the pages in a dictionary, that tally would amount to the number of rare plant species that live in California. There are thousands of them.

"So we inherited this huge thing—so much to lose, so many are rare," he says. And through development and agriculture and the like, "We have devastated California. We have nailed it so hard. And in spite of that, we thought we had only lost 27 species. But then we de-extincted one. We de-extincted another. Last season, CNPS de-extincted another." There are now just 22 extinct plant species in the state, according to CNPS—21 if Magney's gooseberry is confirmed as rediscovered.

The salty wind blows in from the Pacific, the seabirds wing overhead, and the Franciscan manzanita sits before us in its new hilltop home. Gluesenkamp finishes his story with a vision of California's floral future: "We are actually looking at rolling it back," he says, "to a zero extinction state."

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